NOAA - NATIONAL OCEAN SERVICE - NATIONAL GEODETIC SURVEY

Newsletter

OCTOBER 1999

NGS Releases GEOID99

The National Geodetic Survey (NGS) has released a new high-resolution geoid model called GEOID99. The geoid - a surface of equal gravitational potential that approximates the sea-level surface - is important to precise positioning because sea level is the surface to which heights are customarily referenced. GEOID99 is important to modern positioning methods because of the efficiency it contributes to determining precise heights. GEOID99 aids the NGS height modernization effort by improving the ability to readily derive accurate heights above sea level using GPS observations.

The GEOID99 model is the most accurate high-resolution model yet released of the geoid/ellipsoid separation over the United States, and it combines gravimetric as well as datum-transformation information. Surveyors and scientists alike can use the GEOID99 model to help convert NAD 83 (North American Datum of 1983) "ellipsoid" heights - what a GPS receiver yields - into NAVD 88 (North American Vertical Datum of 1988) "orthometric," or mean sea level heights, traditionally used on topographic maps.

In addition to GEOID99, NGS released the companion models G99SSS - a purely gravimetric geoid model - and DEFLEC99 - deflections of the vertical. The deflection of the vertical is the departure of a plumb bob's true pointing from the ellipsoidal normal direction. Deflections are used to relate the orientation of a locally-leveled instrument, such as a theodolite, to a spatial reference system.

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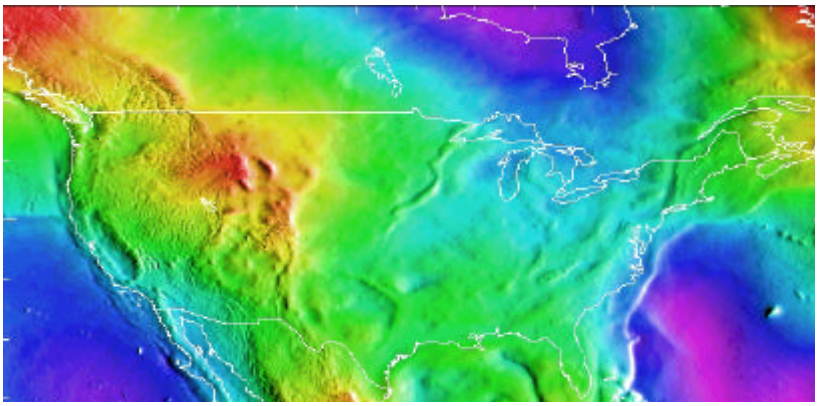
On the Web: *www.ngs.noaa.gov/GEOID/GEOID99/geoid99.html*



Refined geoid model of the continental United States

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NGS Debuts Online Toolkit

On the NGS Web site, you can now use your data along with NGS software programs to perform online computations and datum transformations. NGS has made several of its most popular programs available for interactive use, and the list is growing.

For example, software programs *SPCS83* and *GPPCGP* are now available online to allow users to convert geographic positions to state plane coordinates, and conversely. Program *NADCON* is available to transform coordinates from the North American Datum of 1927 (NAD 27) to North American Datum of 1983 (NAD 83) values, as well as program *VERTCON* to compute the modeled difference in orthometric height between NGVD 29 and NAVD 88 in the conterminous United States.

Users may also predict surface gravity values at a given geographic position and topographic height, predict horizontal displacements and/or horizontal velocities related to crustal motion, obtain the tidal information and orthometric height at a given control point, and compute a modeled geoid height.

The online toolkit may be found at:
www.ngs.noaa.gov/products_services.shtml

NOAA Team Measures Height of Washington Monument

NOAA geodesists took the expression 'get to the point' to new heights. They got to the point, literally, conducting a precise three-dimensional positioning survey at the top of the Washington Monument. These NOAA surveyors are the first in nearly 65 years to "occupy the apex" of the monument. They measured the height and gained valuable information on the stability of the famous structure. "You might think of this new technology as a satellite tape measure that survey experts from NOAA will use to learn the exact height of this treasured monolith," NOAA administrator D. James Baker said of the effort to pinpoint the height of the Washington Monument. Engineers will also use this information to monitor the monument's stability, measuring any shifting, settling, or other movement of the structure.

The National Geodetic Survey (NGS) develops and maintains the National Spatial Reference System (NSRS) - the coordinate reference system that defines latitude, longitude, height, scale, gravity, orientation, and shoreline throughout the nation. Since 1807, NGS and its predecessor agencies have led the world in precise positioning. NGS has developed emerging technologies for the public, including electronic distance measuring instruments and the Global Positioning System. NGS provides its expertise and a wealth of free information, including direct access to its data base, on the Internet at: ***www.ngs.noaa.gov***

Timeless Accuracy in a Changing World

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